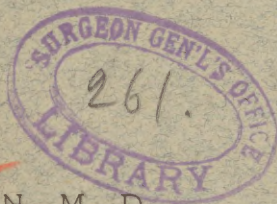


Seguin (S. C.)

THE
EFFICIENT DOSAGE
OF
CERTAIN REMEDIES
USED IN THE
TREATMENT OF NERVOUS DISEASES.

BY



E. C. SEGUIN, M. D.,

CLINICAL PROFESSOR OF DISEASES OF THE MIND AND NERVOUS SYSTEM IN THE COLLEGE
OF PHYSICIANS AND SURGEONS, N. Y.; CORRESPONDING MEMBER OF THE
"VEREINS FÜR INNERE MEDICIN" OF BERLIN, ETC.

NEW YORK.

THE
EFFICIENT DOSAGE
OF
CERTAIN REMEDIES

USED IN THE
TREATMENT OF NERVOUS DISEASES.

READ BEFORE THE MEDICAL SOCIETY OF THE STATE OF NEW YORK
FEBRUARY 7, 1882, AT ALBANY, N. Y.

BY

E. C. SEGUIN, M. D.

NEW YORK.

[REPRINTED FROM THE TRANSACTIONS OF 1882.]

SYRACUSE, N. Y.:
TRUVAIR, SMITH & BRUCE, PRINTERS AND BOOK BINDERS.
1882.



THE EFFICIENT DOSAGE OF CERTAIN REMEDIES

USED IN THE TREATMENT OF NERVOUS DISEASES.

BY E. C. SEGUIN, M. D., OF NEW YORK.

MR. PRESIDENT AND GENTLEMEN : I have been led to prepare this paper by the following consideration. I frequently see uncured cases of nervous disease for which the attending physician has prescribed the proper remedy, but having exhibited it in doses which, though justified by medical authorities, were wholly insufficient to influence the disease, he has failed. This has been more especially true of chorea, of cerebral and spinal syphilis, of certain neuralgias. In these cases the physician had been wanting in the experience and in the courage necessary to fight his way through opposing tradition and book-authority to success.

There are several evident causes for this timidity, which, in a negative way, is nearly as injurious to the patient as too great rashness would be.

In the first place, the influence of teachers in medical schools and of writers of text-books is thrown in favor of small or medium doses. Few if any teachers or writers take special pains to indicate the maximal doses of potent drugs; they teach in a condensed form, and with an eye to the safe training of students. This is very well as applied to students, but a time comes when a physician in active practice wants to know just how much physiological effect can be obtained with certain remedies without positively endangering his patients' lives. In the present state of our medical literature, unless he have time and opportunity to hunt through the files of the leading

medical journals for detailed observations, or to read monographs on experimental therapeutics, he must work out his maximal doses for himself at the cost of much time, of some anxiety, and of not a few failures.

It seems to me that works on therapeutics intended for the practitioner should give, for each important, physiologically active remedy, a paragraph on maximal doses, clearly indicating the amounts necessary to produce the physiological effects (on man), which are often inseparable from remedial effect. These data should be taken from monographs and special articles on the subjects by men who have had experience in the use of the drugs mentioned. For I take it as granted that it is now just as impossible for one man to give us a satisfactory, practical work on therapeutics, as it is for one to produce a uniformly excellent work on the practice of medicine.

In the second place I have observed that many capable druggists are alarmed at doses of certain remedies which are not only harmless, but essential to success. I clearly remember that when a student, I heard the late Prof. Freeman J. Bumstead relate, with a mixture of amusement and anger, how a leading druggist had sent to him to inquire if he really meant to give 3iss¹ of bromide of potassium at one dose. This was twenty years ago. Yet, only a few days since, a patient told me that her druggist told her that she must have a very strong stomach to stand such powerful medicine (she was taking gm. 0.004² of biniodide of mercurcury and gm. 3³ of iodide of potassium three times a day, and under this in one week had lost nearly all her syphilitic pain). Very frequently I have had prescriptions for my usual doses of Squibb's conium returned for revision by the careful pharmacist. I intend nothing derogatory by these remarks, for druggists are supposed to know only the maximal doses of remedies as given by books, and they but do their duty in sending a prescription back for revision, if anything in it seems wrong. For my part, acknowledging a liability to error, I am always glad to see this healthy doubt applied occasionally to my prescriptions; yet I would not have physicians allow themselves to be influenced by the remarks or practice of druggists. Philosophically the professions are absolutely separate: the one

¹Gm. 6.

²Gr. $\frac{1}{16}$

³Gr. xlv.

furnishes the other with the proper implements of treatment in the best possible condition ; and it is the function of the physician to determine by scientific knowledge and by experience how, when, and how much these implements shall be employed. In more senses than one the physician is responsible for the dosage of remedies.

In the third place, it has seemed to me that our large manufacturing drug-firms exert a baneful influence upon therapeutics. They have flooded the country with formulas and ready-made compounds, and thus relieved the physician of the necessity of exerting his power to extemporaneously devise the compound required for the individual patient before him. Increasing numbers of physicians, instead of adapting the *materia medica* to their patients, practically adapt their patients to an already-prepared stock of elixirs, pills, and mixtures. It is so convenient to order one of these, so much easier than to weigh the indications presented by the case, to estimate the patient's susceptibility, and then to write out a good prescription for the case, or more exactly speaking, for the patient.

I propose to briefly review the posology of a few drugs—giving the doses as stated by the best authorities, by writers on therapeutics, and by clinicians, and then stating the doses which I believe to be useful and safe.

I wish it particularly understood that in advocating larger doses of these remedies I do so only on the basis of a tolerably large experience, and not at all from any theoretical scientific considerations. At the same time that I advocate efficient doses, I am carefully observant of all the circumstances which render patients susceptible, and always make an allowance for idiosyncrasy. Thus, in first prescribing a potent remedy, I take into consideration the age, sex, and size of the patient ; and also make an estimate of his general condition, and note particularly the state of his circulatory organs. Then, for a patient whom I see for the first time, I order very small doses, doses such as the books justify, and by steady increase feel my way, fearlessly because watchfully, to the larger doses, often seemingly dangerous doses, which really affect the organism and may cure the disease.

In this matter I make no claim to originality, and would not affirm that the doses I recommend are always essential to suc-

cess ; I simply sum up my experience and place my results at your service.

I.—FLUID EXTRACT OF CONIUM.

(*Extractum conii fructus fluidum*.—U. S. P.)

DOSES AS GIVEN BY AUTHORITIES ON THERAPEUTICS AND MATERIA MEDICA.

Is not mentioned by STILLÉ and MAISCH, by STILLÉ, by NOTHNAGEL, and by GUBLER.

WOOD.—Therapeutics (1880), p. 371. “Dose, ℥ 1 to 2. (!)”

BARTHOLOW.—Materia Medica (1880), p. 409. “Dose ℥ 2, ℥ 5, increased to ℥ 40.”

RICE.—Posological Tables (1879), p. 28. “Dose, from 3 to 5 minims, to be increased with caution.”

DOSES AS GIVEN BY CLINICIANS.

Conium, in the form of fluid extract, is not, to my knowledge, mentioned by any standard writer on the practice of medicine.

MEIGS and PEPPER, Diseases of Children (1870), p. 505, article chorea, refer to Dr. J. Harley's doses of succus conii with apparent astonishment.

To Dr. JOHN HARLEY, (The Old Vegetable Neurotics, London, 1867,) we owe the present rational or physiological use of conium. He swept away the former traditions of the potency of the drug, and showed that most of its preparations were inert. He obtained definite physiological and therapeutical results from the succus conii, administered in doses of from ʒ ii (gm. 8) to ʒ i (gm. 32). By means of these quantities he obtained the paresis of third nerves, arms and legs, which is the characteristic result of conium action of the spinal cord.

The prototype of our excellent officinal preparation, the fluid extract made by Dr. Squibb, was unknown to Dr. Harley until just as his book was going to the press. (Page 94, note.)

Dr. Squibb and Dr. Manlius Smith had, however, already read a paper before this Society, at its meeting in 1867, entitled: “An attempt to answer the question, Which part of conium is the best for medicinal use?” (See Transactions of the New York State Medical Society for 1867, p. 377.)

Ever since, we, on this side of the Atlantic, have possessed by far the most reliable and the most powerful preparation

of conium ; but I am sorry to add that it has been used rather inefficiently, and that even intelligent physicians are afraid to use the only doses which have any effect.

PERSONAL EXPERIENCE.

I have used conium a good deal in the last ten years, and have always employed the fluid extract as made by Squibb. I have tried it in chorea, in spasms of paralyzed limbs, in general irritability, and in insomnia.

When the indication is present, as in chorea, to obtain muscular relaxation, after a few tentative doses of 20 and 40 minims, (gm. 1.2—2.4.) I give at one dose 60, 80, or even 100 minims, (gm. 3.6—4.8—6.) These doses cause drooping of the upper lids (sometimes diplopia and paresis of the arms and legs. I do not repeat the dose until after the effects have passed off—in from 12 to 24 hours.

In a case of chronic adult chorea of 14 years' standing, which I almost perfectly cured in 1872—3, at the Epileptic and Paralytic Hospital on Blackwell's Island, a large part of the result (a very remarkable result in my experience) was attributable to paresis daily produced by a teaspoonful of Squibb's extract of conium for a month or more.

Many cases of insomnia, with wakefulness in the first part of the night, more especially those with fidgets or physical restlessness, are very much benefited by conium. I usually give 20 minims, (gm. 1.2) with 20 grains (gm. 1.3) of bromide of sodium in camphor water, at bed-time, to be repeated if necessary. In some cases (male adults) I give 50 to 60 minims (gm. 3—3.6) at one dose, not to be repeated. Such a sleeping-draught prescription has been repeatedly returned to me by druggists, because they thought the dose enormous. Indeed I usually warn patients that the druggist may comment on the dose.

If we have a clear indication to give conium, we ought to give enough to fulfill the indication, and this cannot be done without obtaining the physiological effects. With due precaution, there is a wide and sure distance between physiological and toxic effects, yet, with reference to remedies such as I shall refer to, how few physicians understand and appreciate that the curative effects are obtained in just that interval between physiological and toxic effects. To be successful we

must be bold, as bold as physiological knowledge can make us, and yet as cautious in the first giving of powerful drugs to a patient as if we had no courage at all.

II.—FOWLER'S SOLUTION.

(*Liquor potassii arsenitis*. U. S. P.)

In this preparation, ℥j contains $\frac{1}{120}$ grain or gm. .0005 of arsenious acid.

DOSES AS GIVEN BY AUTHORITIES ON MATERIA MEDICA AND THERAPEUTICS.

STILLÉ and MAISCH, National Dispensatory (1879), p. 864, state only that the commencing dose is 5 drops (which is too much for some cases.)

STILLÉ.—Therapeutics (1874) Vol. II. p. 811. "Dose, 5 drops generally increased to 10 or twenty drops three times a day, largely diluted and taken after meals."

WOOD.—Therapeutics (1880), p. 385. "Average commencing dose is 5 drops in a wine-glassful of water after meals, to be increased." Page 382, "the dose must be steadily increased until œdema or other manifestations betray its decided action." [In chorea.]

BARTHOLOW.—Materia Medica (1880), p. 124. "Dose, from 2 to 10 minims. In this disease [speaking of chorea] large doses—5 minims *ter in die*—must be given." p. 130. (!)

RICE.—Posological Tables (1879, p. 45. "The dose is 3 to 10 minims and more, with caution."

NOTHNAGEL AND ROSSBACH.—Arzneimittellehre (1878), p. 212. "Dose, from 2 to 5 drops three times a day."

GUBLER.—Leçons de Thérapeutique (1877), p. 100. "Dose, 5 to 20 drops per diem."

DOSES AS GIVEN BY AUTHORITIES ON CLINICAL MEDICINE.

AUSTIN FLINT, SR., Practice of Medicine (1881), p. 811, speaking of the treatment of chorea, says: "Fowler's solution is the most eligible preparation. Commencing with three or four drops three times daily, the dose should be gradually increased until the characteristic effects are observed."

Nothing is said of the mode of administration, or of the maximal dose. I must confess to a doubt whether this eminent teacher and practitioner does use really efficient doses, for he says, also on p. 811, "of the divers remedies indicated,

none can be relied upon for promptly arresting the course of the disease, and it is doubtful if any exert a special curative agency."

C. B. RADCLIFFE, Reynold's System of Medicine [American edition, 1879], Vol. I. p. 712, article Chorea, correctly and fully describes, the progressive and fearless dosage of this remedy, increased from 5 drops after each meal to saturation of the system. If gastric derangement occurs, he suspends treatment for a while and then goes on. He quotes Dr. Begbie as giving it in the same way, and he has never known it to fail in 30 years.

MEIGS AND PEPPER, Diseases of Children (1870), p. 564, quote Radcliffe, and add, "Fowler's solution given in ordinary doses and immediately after eating, and steadily persisted in until some evidence of its constitutional effects are observed."

If these writers correctly express their meaning, simply "persisting" in ordinary doses (5 to 10 drops) is the proper method. But it is by just such a method that chorea may be perpetuated and a belief in the non-efficiency of drugs engendered in the physician's mind.

J. LEWIS SMITH, Diseases of Children (1880), p. 496, recommends equally useless doses of arsenic. "A child of eight years can take 5 drops, diluted in water, three times daily, after eating; and the dose may be increased if needed to eight drops."

HAMMOND, Diseases of the Nervous System (1881), p. 745, correctly describes the arsenical treatment of chorea by giving Fowler's solution *per os*, and by hypodermic injection.

The internal doses he increases by 1 drop every three days, which in my opinion is too slowly. He gives his preference to the hypodermic injections of diluted Fowler's solution in doses varying from 10 to 30 minims. (gm. 0.6 to 1.8.)

PERSONAL EXPERIENCE.

My own experience is in substantial accord with that of Radcliffe and of Begbie, in that I have almost never known arsenic to fail to cure chorea and often very quickly. I have almost always given Fowler's solution by the stomach in doses ranging from 3 to 30 drops three times a day.

It is exhibited largely diluted with water, usually half a tumblerful or from 3 to 4 ounces, (gm. 90 to 120) and given

after food, although I am now inclined to think that the importance of this latter caution has been over-estimated, and is not as great as is that of proper dilution.

In children who are delicate and in sensitive adults I sometimes commence with a dose of 2 drops after each meal ; more usually, however, with a dose of 5 drops. Each day I add 1 drop ; thus : On the first day the patient takes 5 drops three times a day, on the second day 6 drops three times a day, the third day 7 drops three times, and so on.

Usually, when a dose of from 10 to 14 drops three times a day is attained, some arsenical symptoms appear ; these are diarrhœa, nausea, vomiting, anorexia, redness and puffiness about the eyes ; one of these symptoms or any combination of them. They are not serious, and during their prevalence I have never found albumen in the urine. My practice formerly was to go back to smaller doses when this condition developed and to again increase ; but in the last two years I find it more advantageous to withhold all arsenic for forty-eight hours and then resume at the last dose and begin a further increase. A remarkable tolerance is now shown by most patients, even by young children ; and doses of 20, 25, and even 30 drops thrice a day may be reached without a renewal of these symptoms.

I recently had a chronic and relapsing case of hemi-chorea in a girl fourteen years old which resisted doses of 34 drops three times a day, an equivalent of one grain (gm. 0.06) of arsenious acid per diem. My directions as to physical and mental rest were disregarded by parent and patient, and this may account for the failure of the arsenic. Under the use of 2 grains (gm. 0.13) and 3 grains (gm. 0.19) doses of bromide of zinc the movements ceased within a month after the discontinuance of the arsenic.

I have been taught by experience not to expect amelioration of the choreic movements until the toxic effects of arsenic are evident ; and in old, or relapsing cases, not until the second period of toxic symptoms. I nearly always combine rest, nearly absolute rest in bed, in severe cases, with the arsenical treatment and, if the patient be wakeful or nervous at night, an occasional bed-time dose of chloral hydrate *per os* or by enema, is given.

Simple, acute chorea may often be cured in two weeks' time by this plan, in positive contradiction to the too prevalent

notions of self-limitation of chorea and skepticism as to the efficacy of drugs in this disease.

As regards possible ill-effects from this arsenical treatment, I would repeat that, though I have examined the urine of many patients at the periods of saturation by arsenic, I have never found albumen or tube-casts. Stomatitis I have seen but once, in the case of a physician's son, whose chorea was very rapidly and permanently cured by moderate doses (about 18 drops three times a day). Cutaneous symptoms I have never met with; and the gastro-intestinal irritation has never been serious or permanent.

My experience with the hypodermic injection of Fowler's solution is more limited. I have made use of it in chronic chorea, and in local choreiform affection, and I would agree with Dr. Hammond in his statement that we relatively obtain less constitutional disturbance and more curative effect from this method.

III.—CRYSTALIZED ACONITIA OF DUQUESNEL.

(*Aconitia*.—U. S. P.)

DOSES AS GIVEN BY AUTHORITIES ON MATERIA MEDICA AND THERAPEUTICS.

STILLÉ and MAISCH.—National Dispensary (1879,) p. 101.*

“Primary dose $\frac{1}{250}$ grain two or three times a day. It is recommended in doses of $\frac{1}{125}$ grain.”

WOOD, Therapeutics (1880), p. 180, makes the truly astonishing statement that: “The alkaloid is officinal, but, on account of its intense activity, should not be given internally.”

This was printed more than a year after the publication of the New York Therapeutical Society's report on aconitia in the *New York Medical Journal* for 1878

BARTHOLOW, *Materia Medica* (1880), p. 44, simply quotes the New York Therapeutical Society's formula. No personal statement as to doses.

RICE.—Posological Tables (1879), p. 5: “Aconitia; aconitine. Alkaloid from aconite. The commercial product is an impure mixture of alkaloids. The dose is $\frac{1}{160}$ to $\frac{1}{130}$ grain, increased with caution. Chiefly externally.”

* In this paragraph occur several serious misprints. The dose of $\frac{1}{125}$ grain is rendered as gm. 0.005, which is really $\frac{1}{2}$ grain, and might prove fatal. In speaking of external applications, 2 and 5 grains are rendered as gm. 0.133 and 0.333, which are correct figures; but immediately after it we find one grain rendered as gm. 0.666, in reality nearly eleven grains.

NOTHNAGEL and ROSSBACH.—*Arzneimittellehre* (1878) p. 721. "Aconitia is little employed internally. Dose, gm. 0.004. ($\frac{1}{10}$ grain,) and the daily quantity gm. 0.03 ($\frac{1}{2}$ grain)."

This cannot refer to Duquesnel's aconitia. It might be a safe guide for giving Merck's aconitia, which is very impure and of doubtful efficacy.

GUBLER.—*Leçons de Thérapeutique* (1877), pp. 147-8. Prof. Gubler may be considered as the introducer of Duquesnel's aconitia. In articles, besides in this book he was the first to indicate its wonderful efficacy in neuralgia, particularly trigeminal neuralgia.

He recommends gm. 0.0005 ($\frac{1}{2000}$ grain), or less at first; gradually increased to gm. 0.002—0.004—0.005 ($\frac{1}{200}$, $\frac{1}{16}$, $\frac{1}{32}$ grain.)

DOSES RECOMMENDED BY CLINICIANS.

As Duquesnel's aconitia has been known so few years, and has been in use less than four years in this country, it is not surprising that our principal text-books do not speak of it. Still one is surprised to find that Prof. Flint, in the last edition of his "Practice," dated 1881, does not refer to aconitia among the remedies which may cure neuralgia.

HAMMOND, *Diseases of the Nervous System* (1881), pp. 857-8, speaking of the treatment of neuralgia, recommends Duquesnel's aconitia in doses of $\frac{1}{120}$ grain, gradually increased to $\frac{1}{48}$ grain if necessary, till relief be obtained, or till the characteristic peripheral numbness occurs.

PERSONAL EXPERIENCE.

Influenced by Prof. Gubler's article and by his book, I began using the aconitia of Duquesnel in the winter of 1877-8, with most gratifying results. More of the drug was imported, and in a few months several of my friends were trying the remedy—among them I may name Dr. McBride and Dr. Andrew H. Smith.

At a meeting of the Therapeutical Society of New York held October 11, 1878, I presented the report of the Committee on Neurotics of that Society upon the use of this aconitia. We reported ten cases cured or relieved. This report will be found in the *New York Medical Journal* for December, 1878.

Since that time aconitia has been used by many physicians in numerous cases of trigeminal neuralgia, with very favora-

ble results. A large proportion of cases have been cured, and some very ancient cases (8 to 12 years) relieved very much by the medicine. A few cases only have been uninfluenced.

In the last two years the alkaloid has been offered in pillular form by several reliable drug firms, and I can testify to the potency and reliability of Caswell & Hazard's tablets, and of Schieffelin's pills. These firms furnish doses of $\frac{1}{200}$ grain and of $\frac{1}{100}$ grain.

In my first use of aconitia I employed a solution made by the late Dr. William Neergaard, the only pharmacist who then (1877-8) held a sample of Duquesnel's preparation.

R Aconitiæ (Duquesnel's), gr.	$\frac{1}{10}$	1006
Glycerinæ		
Alcoholis, aa	$\frac{3}{4}$ i	4
Aquæ menth., pip., ad	$\frac{3}{4}$ ij	60

Each teaspoonful (estimating seven teaspoonfuls to the ounce) contained about $\frac{1}{40}$ grain (gm. 0.00046). This dose was to be given two, three, or more times a day, on an empty stomach, till the pain ceased or the physiological symptom—numbness—was produced. As my subject to-day is not clinical therapeutics as much as posology, I pass by many interesting facts about the use of aconitia and omit all cases.

The remark which I have already made about the necessity of giving small doses of potent drugs to a patient whom we see for the first time, and of estimating his susceptibility applies with especial force to aconitia. Bearing this in mind and carrying it into practice, we may be very bold, almost rash, later on, without running real danger.

Those of us who introduced aconitia in 1878 soon discovered that some persons, females especially, were powerfully affected by minute doses. Dr. A. H. Smith reported a case to our Committee in which a lady was distressed by $\frac{1}{400}$ grain, and I myself, while in a reduced state of health and suffering severe trigeminal pain, was much benumbed by $\frac{1}{200}$ grain, (though long afterward, when quite well, it required two doses of $\frac{1}{100}$ grain to produce nearly similar effects).

It is well, consequently, to give debilitated, susceptible, and female patients, doses of $\frac{1}{250}$ or $\frac{1}{200}$ grain (gm. 0.00026 to gm. 0.00032) to begin with. These facts have induced the Messrs. Schieffelin & Co. to cease making pills of $\frac{1}{100}$ grain, and to furnish only the $\frac{1}{200}$ grain which can be repeated at will.

Messrs. Caswell & Hazard still furnish both doses in the shape of soluble tablets.

In a case of neuralgia, after a day's testing with minute doses if I find no undue susceptibility to the drug I give it freely— $\frac{1}{100}$ grain (gm. 0.00065) every 3 or 4 hours until distinct numbness and coldness (subjective coldness) be felt in the limbs and face. Then a longer interval may be allowed before giving another dose. Some subjects will take 3 or 4 tablets of $\frac{1}{100}$ grain, each day, and be in a constant state of numbness without harm, and often with curative effect.

In some of my cases of chronic epileptiform neuralgia I have kept patients under the influence of the drug for days and weeks,—and have seen no evidence of cumulative effects.

As a rule, in testing a man of average physical development and not reduced by disease I at once start with doses of $\frac{1}{100}$ grain (gm. 0.00065).

As regards maximal doses, I may state that in certain cases of posterior spinal sclerosis with severe fulgurating pains I have given from 4 to 8 doses of $\frac{1}{100}$ grain each in 24 hours, producing in some cases faintness, sickness, and a considerable prostration. I might add that this form of nerve pain has never been relieved by aconitia, and that with hardly an exception, all the tabetic patients I have experimented on have not shown any trace of the numbness which is *the* sign of aconitia effect in healthy persons.

As a rule, the pain of trigeminal neuralgia ceases when the physiological effects of the drug are manifest. I do not pretend, and Prof. Gubler did not claim that aconitia is a certain or specific remedy against trigeminal neuralgia, but it certainly is the best of all our present therapeutic resources against this terrible disease. Of course in certain cases, special etiological factors must be considered, and other treatment given besides the aconitia: for example, in clearly malarial neuralgia, and in syphilitic neuralgia, or in the (rare) neuralgia from bad teeth.

IV.—PHOSPHORUS AND PHOSPHIDE OF ZINC.*

(*Phosphorus*.—U. S. P.)

DOSES GIVEN BY AUTHORITIES ON MATERIA MEDICA AND THERAPEUTICS.

STILLÉ and MAISCH. National Dispensatory (1879), p.

* The equivalent of zinc phosphide (Zn_3P_2) is $195.6 + 62 = 257.6$. Consequently one part of the phosphide contains 25 per ct. (about) of phosphorus.

1072. These authors, apparently wholly relying upon Gubler and Thompson, state that the dose varies from $\frac{1}{30}$ to $\frac{1}{4}$ grain. They say: "Those who have most advocated its use recommend that a first dose of one eighteenth of a grain (gm. 0.003) should be repeated every four hours till six doses are taken. If then no improvement (in neuralgia) have occurred, the dose should be increased to one-twelfth of a grain (gm. 0.005), and repeated in the same manner as before."

They do not, however, mention Thompson's alcoholic solution of phosphorus.

Zinc phosphide (p. 1546) in "doses of $\frac{1}{16}$ to $\frac{1}{8}$ grain, and even $\frac{1}{4}$ grain."

STILLÉ.—Therapeutics (1874), vol. i, p. 800. "Moderate doses of $\frac{1}{40}$ to $\frac{1}{4}$ grain."

WOOD.—Therapeutics (1880) p. 113 recommends a mixture containing oleum phosphoratum, each dose to contain from $\frac{1}{30}$ to $\frac{1}{16}$ grain; or of a chloroformic solution in a mixture, $\frac{1}{16}$ grain.

The dose of zinc phosphide he gives as $\frac{1}{100}$ to $\frac{1}{50}$ grain, which is in striking contradiction to his full doses of phosphorus.

BARTHOLOW.—Materia Medica (1880), p. 96. "Dose of oleum phosphoratum, U. S. P., 5 to 10 drops (equal to $\frac{1}{24}$ or $\frac{1}{12}$ grain, as each m of Ol. = gr. $\frac{1}{120}$ of P.).

Quotes Radcliffe's formula for pil. phosphori, $\frac{3}{100}$ grain in each pill. Also quotes Thompson's tinctura phosphori in doses equivalent to $\frac{1}{40}$ to $\frac{1}{20}$ grain.

"The dose of phosphide of zinc is $\frac{1}{12}$ to $\frac{1}{4}$ grain."

RICE.—Posological Tables (1879). Oleum phosphoratum (p. 54). No dose given. [Recommends Dr. Squibb's solution: Phosphorus, 1 part; cod-liver oil, 99 parts.]

"Phosphorus, $\frac{1}{100}$ to $\frac{1}{20}$ grain, increased with caution."

NOTHNAGEL and ROSSBACH.—Arzneimittellehre (1878), p. 200. "Dose from $\frac{1}{80}$ to $\frac{1}{12}$ grain (gm. 0.001—0.005)."

GUBLER.—Leçons de Thérapeutique (1877), pp. 236–7. "Dose, gm. 0.001 ($\frac{1}{60}$ grain) in granules; from 2 to 10 a day."

Praises the oleum phosphoratum in capsules.

"Zinc phosphide, from $\frac{1}{6}$ to 1 grain (gm. 0.01—0.06) per diem"; he rather depreciates its virtues.

DOSES AS GIVEN BY AUTHORITIES ON CLINICAL MEDICINE.

HAMMOND.—Diseases of the Nervous System (1881), p. 69. Speaking of cerebral congestion, he says that the oleum

phosphoratum may be given in a mixture in doses of 5 drops (or about $\frac{1}{8}$ grain of phosphorus.)

Zinc phosphide, whose formula he gives as Zn_3P , and estimates as containing $\frac{1}{4}$ of phosphorus, he recommends in $\frac{1}{10}$ grain dose, in pill form (this gives $\frac{1}{40}$ grain of phosphorus); or the phosphoretted resin may be used to make pills, each containing $\frac{1}{80}$ grain of phosphorus.

FLINT, Practice of Medicine (1881), p. 797, merely names phosphorus as a remedy for neuralgia; gives no doses or estimate of its value.

ANSTIE, On neuralgia (1871), p. 180, states that he has used the phosphoretted oil and pills of phosphorus (Dr. Radcliffe's), containing $\frac{1}{30}$ grain three times a day. He does not estimate it as specially useful. (This was written before the publication of Thompson's work.)

J. ASHBURTON THOMPSON.—Free Phosphorus in Medicine, London, (1874), p. 190: "The chief precaution to be observed in the treatment of neuralgia with free phosphorus * * * is to administer a full dose of the remedy in the first place."

"* * * unless half a grain or more be given in the course of each twenty-fours, frequent failures, or only partial successes in treatment will be met with." But the remedy must be given in not less than this dose, *i. e.*, one-twelfth of a grain repeated every four hours, from the beginning of treatment."

Page 191. He admits the utility of the alcoholic and ethereal solution, reduced phosphorus, and even zinc phosphide, but he has had the best results from one-twelfth of a grain of phosphorus dissolved in cod-liver oil every four hours.

Thompson has more recently furnished the following formula for the preparation of a solution of phosphorus, which is not unpalatable to most patients:

Take of

Phosphorus,	gr. i		06
Absolute alcohol,	$\frac{3}{4}$ v	20	

Dissolve with heat.

Glycerine,	3 xii	48	
Alcohol,	3 ii	8	
Essence of peppermint,	3 ii	2	5

Mix the two solutions, which make nearly 3 xx; 3 i = $\frac{1}{20}$ grain (gm. 0.003.)

Very soon after the appearance of Dr. Thompson's article, I caused this solution of phosphorus to be made by Mr. F. Haas, by Caswell, Hazard & Co., and by the late Dr. Neergaard, and used it a great deal. A weaker preparation or imitation, under the name of elixir of phosphorus, one teaspoonful of which contains $\frac{1}{40}$ grain, is also sold, but I prefer the stronger form, and write for *solutio phosphori* (Thompson.)

I have employed this solution with the greatest success in trigeminal neuralgia, and with some success in other neuralgias—following Thompson's plan of giving full doses, usually 1 teaspoonful (about $\frac{1}{8}$ grain, if we estimate a teaspoonful to be a little over $\frac{1}{2}$ i), every three or four hours. I have known a severe facial neuralgia (not chronic epileptiform neuralgia) cured in two days, and even in 24 hours; several cases in a week.

In conditions of nervous prostration, cerebral anæmia, incipient cortical degeneration (dementia), in melancholia, I have been much pleased with a combination of Thompson's solution and cod-liver oil in the proportions of 1:6 or 1:4, a tablespoonful of the mixture being given after each meal.

In other cases I have had an extemporaneous mixture made and given two or three times a day: Thompson's solution, 1 teaspoonful; sherry, two tablespoonfuls; cod liver oil, from 1 to 2 tablespoonfuls; and the yolk of one egg, thoroughly beaten and mixed, with the addition of a little extra oil of peppermint. This is well received by most patients, and constitutes a most valuable tonic.

The phosphide of zinc in doses of $\frac{1}{6}$ to $\frac{1}{4}$ grain (gm. 0.011 to 0.016) combined with nux vomica or with belladonna, according to indications, has seemed of some efficacy in the treatment of posterior spinal sclerosis, of cerebral anæmia, of nervous prostration ("neurasthenia"), and of incipient dementia.

With pills of pure phosphorus I have had little experience. The pills offered by most of our manufacturing drug concerns are of too small a dosage. As may be seen from the citations made, and from my own experience with other preparations, the giving of $\frac{1}{100}$ grain (gm. 0.0006), or even of $\frac{1}{50}$ grain (gm. 0.0012) of phosphorus is of probably very little use. From $\frac{1}{30}$ to $\frac{1}{10}$ grain (gm. 0.002–0.006) should be administered

three times a day, with, of course, due watchfulness for signs of gastric irritation.

V.—CRYSTALLIZED NITRATE OF SILVER.

(*Argenti nitras*, *U. S. P.*)

DOSES AS GIVEN BY AUTHORITIES ON MATERIA MEDICA AND THERAPEUTICS.

STILLÉ and MAISCH.—National Dispensatory (1879), p. 237. "Dose from $\frac{1}{6}$ to $\frac{1}{4}$ grain three times a day. Doses of $\frac{1}{2}$ grain occasion no special symptoms, but larger quantities are apt to cause gastric heat, pain and nausea.

STILLÉ, Therapeutics (1974), i, p. 367, *et seq.*, quoting authors upon diseases of the nervous system, refers to doses varying from $\frac{1}{6}$ to $\frac{1}{4}$ grain, three times a day.

WOOD.—Therapeutics (1880), pp. 51-3. "Dose from $\frac{1}{4}$ to $\frac{1}{2}$ grain, in pill form, given upon an empty stomach, when it is desired to affect the stomach, and after meals, when the constitutional effects of the drug are desired."

"When given for a chronic disease, its administration should be suspended for one week, at the end of every third week, and its employment should not extend over a longer time than three months, without a protracted intermission."

BARTHOLOW, Therapeutics (1880), pp. 213-5, gives elaborate directions and formulas for its use in various visceral affections, dyspepsias, gastritis, colitis, etc., but hardly refers to its use in nervous diseases, and does not recommend it.

RICE.—Posological Tables (1879). "Dose $\frac{1}{4}$ to 2 grains: increased with caution."

NOTHNAGEL and ROSSBACH.—*Arzneimittellehre* (1878,) p. 113. "In pill form, gm. 0.005—0.03 ($\frac{1}{12}$ to $\frac{1}{2}$ grain)."

GUBLER, *Leçons de Thérapeutique* (1877), p. 579, thinks that no good effects are to be expected from its internal use, and gives no doses.

DOSES AS GIVEN BY AUTHORITIES ON CLINICAL MEDICINE.

The older English physicians, Sims, Wilson, Harrison, and Roget, quoted by STILLÉ, Therapeutics, i, p. 367, gave doses of one, two, three and even six grains, three times a day for epilepsy. It is not now employed for this disease, I believe.

FLINT, Practice of Medicine (1881), p. 476, treating of locomotor ataxia, recommends giving from $\frac{1}{6}$ to $\frac{1}{3}$ grain, three

times a day, for several weeks ; then suspending its use for a while.

HAMMOND, *Diseases of the Nervous System* (1881), p. 633 in the treatment of locomotor ataxia, merely mentions doses of $\frac{1}{4}$ grain three times a day ; gives no details, and does not seem to attach any value to the drug.

WUNDERLICH, *Archiv der Heilkunde*, 1861, ii, p. 193 (cited by STILLÉ, p. 368), gave $\frac{1}{8}$ grain twice and thrice a day ; quoted by TOPINARD, he gave $\frac{1}{8}$ grain three or four times a day ; for locomotor ataxia.

BOUCHUT (cited by STILLÉ, pp. 368-9), *Bull. de Thérap.*, lxiv, p. 57, gave to a child 5 years old, with paraplegia, $\frac{1}{10}$ grain twice a day. To adults for paralysis from $\frac{2}{3}$ to 1 grain a day.

TOPINARD, *De l'ataxie locomotrice*, Paris, 1864, pp. 435-468, gives a full account of the attempts to cure sclerosis of the posterior columns by silver ; relates several cases of his own, and concludes that the drug is usually useless in locomotor ataxia ; he gave from $\frac{1}{6}$ to $1\frac{1}{2}$ grains *per diem*.

He cites the following doses as prescribed by several well-known physicians :

“CHARCOT and VULPIAN in 1862 gave doses of $\frac{1}{6}$, $\frac{1}{3}$, $\frac{1}{2}$ grain three times a day. Later CHARCOT has given as high as $1\frac{1}{2}$ grains in a day.

PIDOUX, $1\frac{1}{2}$ grain *per diem*.

GUBLER and BEAU, $1\frac{1}{2}$ gr. *per diem*.

HILLAIRET, $2\frac{1}{2}$ gr. *per diem*.”

W. ERB, *Ziemssen's Cyclopædia*, Am. ed., vol. xiii, On Diseases of the Spinal Cord, pp. 614-5, recommends from $\frac{1}{6}$ to $\frac{1}{3}$ grain three times a day, or from 1 to $1\frac{1}{2}$ grains *per diem*, until 120 or 150 grains have been consumed. He has a high opinion of the medicine, for he says, p. 614 : “Among the *internal remedies* for tabes, nitrate of silver undoubtedly stands first, as it can show quite undoubted results.”

PERSONAL EXPERIENCE.

I have employed nitrate of silver extensively in the treatment of locomotor ataxia, and am almost disposed to agree with Erb. I can most positively assert that in quite a number of my cases the course of the disease has been materially checked, and in many others repeated periods of relief have been secured by nitrate of silver.

I have also given it in various forms of subacute and chronic myelitis, but with less definite results; though my impression of its action in these cases is favorable.

I never prescribe less than $\frac{1}{4}$ grain (gm. 0.0126) of nitrate of silver at a dose, and usually give $\frac{1}{2}$ grain (gm. 0.03). The remedy is made up in a pill with an indifferent extract (taraxacum), or with extract of nux vomica, or with extract of belladonna, according to the indications of the case, whether for spinal stimulation or for sedation.

I always give the pill before meals, three times a day, and occasionally administer a fourth pill at bedtime. A course of silver, with me, usually lasts two months, which at the rate of $1\frac{1}{2}$ grains (gm. 0.10) a day, would give 90 grains (gm. 6.)—a perfectly safe quantity as regards danger of discoloration of the skin. After an interval of two or three months I often give another, shorter course, and so on.

None of my patients has as yet shown discoloration (argyria), and I have seldom been annoyed by the occurrence of gastric and intestinal irritation. Albuminuria I have never seen.



July 1st 1881

15 1/2

July 1st 1881

12 1/2

12 1/4

Proctor & Co

